



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/827,067	04/19/2004	Naoto Kimura	NEC 19.740A	2361
26304	7590	03/14/2005	EXAMINER	
KATTEN MUCHIN ZAVIS ROSENMAN			THAI, LUAN C	
575 MADISON AVENUE			ART UNIT	
NEW YORK, NY 10022-2585			PAPER NUMBER	

2829

DATE MAILED: 03/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/827,067

Applicant(s)

KIMURA, NAOTO

Examiner

Luan Thai

Art Unit

2829

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-22 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 9,13-15,17 and 21 is/are rejected.
- 7) ☒ Claim(s) 10-12,16,18-20 and 22 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☒ Certified copies of the priority documents have been received in Application No. 10/151,416.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4/19,7/14& 10/5/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Priority

1. This application appears to be a continuation of Application No. 10/151,416, filed May 20, 2002.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 9 and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Ball (6,407,456) and Yamada et al. (6,476,502) separately.

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claims 9 and 17, Ball (see specifically figures 4-5) disclose a semiconductor device comprising a board (16), first and second intermediate substrates (14A-14B) mounted on the board (16) apart from each other, and a first semiconductor chip (54) having a first surface (56) on which a plurality of first pads (58) are formed and a second surface (52) opposed to the first surface, the semiconductor chip (54) being

mounted over the first and second intermediate substrates (14A-14B) in such a manner that a part of the second surface (52) of the semiconductor chip (54) faces the first intermediate substrate (14A) and another part of the second surface (52) of the semiconductor chip (54) faces the second intermediate substrate (14B). Ball further discloses a second semiconductor chip (70) having a third surface (74) on which a plurality of second pads (76) are formed and a fourth surface (68) which opposes the third surface, the second semiconductor chip (70) being mounted over the first and second intermediate substrates (14A-14B) in such a manner that a part of the fourth surface (68) faces the first intermediate substrate (14A) and another part of the fourth surface (68) faces the second intermediate substrate (14B).

Yamada et al. (see specifically figure 6) also teach a structure identical to Ball's structure device; therefore, the claimed structure in claims 9 and 17 are also rejected under 35 U.S.C. 102(e) as being anticipated by Yamada et al. for the similar reasons detailed above.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ball (6,407,456) and over Yamada et al. (6,476,502) separately.

Regarding claims 14-15, each of Ball and Yamada et al. discloses the claimed invention as detailed above except for specifying the first and second substrates being formed of a silicon substrate including electronic components formed therein.

Although Ball or Yamada does not explicitly teach the first and second substrates (14A-14B in Ball structure) or (48 in Yamada structure) being formed of a silicon substrate, these substrates are disclosed (by Ball and Yamada) as semiconductor dice (or chips), which are considered as electronic components. Moreover, die or dice of semiconductor chips comprise pieces separated from a wafer, which is well known to be made from silicon (e.g., semiconductor material). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the semiconductor dice or chips (in Ball or Yamada device) to be formed from silicon since silicon is known material for making dice.

6. Claims 13 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ball (6,407,456) and over Yamada et al. (6,476,502) separately.

Regarding claims 13 and 21, each of Ball and Yamada et al. discloses the claimed invention as detailed above except for specifying the shape (e.g., rectangular shape) and the size (e.g., either one side of the rectangular shape being less than 20 mm in length) of the first and second intermediate substrates.

However, a semiconductor die is commonly formed in a rectangular shape with at least one size less than 20 mm in length. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the first and second intermediate substrates (e.g., the semiconductor dice 14A-14B) to have their shape and

their dimension in the range as claimed since such claimed shape and dimension of a die are common in semiconductor art, and the dimension and the shape of the dice (or a semiconductor substrate) is an art recognized variable of importance which is subject to routine experimentation and optimization.

Note that the specification contains no disclosure of either the critical nature of the claimed dimensions of any unexpected results arising there from. Where patentability is aid to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical.

Allowable Subject Matter

7. Claims 10-12, 16, 18-20 and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter:

The prior art taken either singly or in combination fails to anticipate or fairly suggest: a) *the first intermediate substrate having a plurality of first bonding pads and the second intermediate substrate having a plurality of second bonding pads, each of the first bonding pads of the first intermediate substrate being connected via a first wire to an associated one of the first pads of the first semiconductor chip, and each of the second bonding pads being connected via a second wire to an associated one of the first pads of the first semiconductor chip*, as recited in claims 10 and 18; and b) *the electronic components include at least one of a capacitor and a resistor*, as recited in claims 16 and

Art Unit: 2829

22; especially when these limitations are considered within the specific combination claimed.

Claims 11-12 and 19-20 are also objected to as being depend upon either objected base claims 10, 16, 18 or 22.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luan Thai whose telephone number is 571-272-1935. The examiner can normally be reached on 6:30 AM - 5:00 PM, Monday to Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bradley W. Baumeister can be reached on 571-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Luan Thai

Primary Examiner

Art Unit 2829

March 7, 2005